United States Department of Agriculture

Economic Research Service

Natural Resources and Environment Division

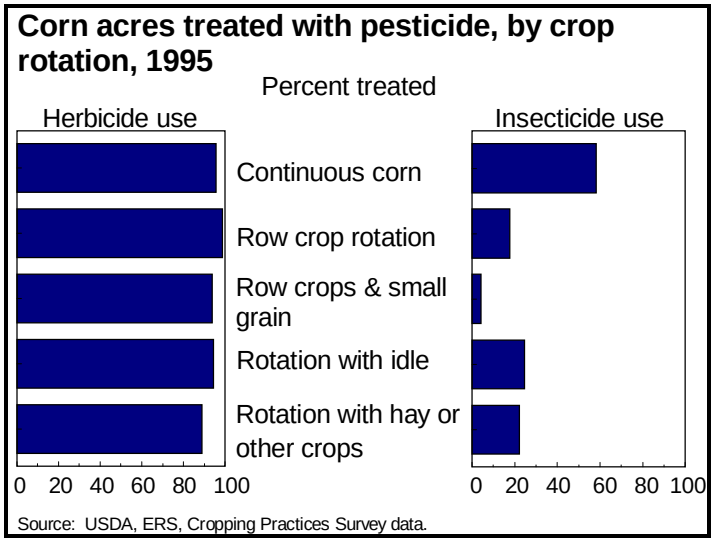
AREI **UPDATES**

Updates on Agricultural Resources and Environmental Indicators Number 18 Dec. 1996

Cropping Patterns of Major Field Crops and Associated Chemical Use

- **In 1995, nearly 60 percent of soybean and about half of corn acreage in major producing States were in a corn-soybean rotation. In contrast, over two-thirds of cotton acreage was in monoculture, and the two most popular cropping patterns in wheat-growing States were wheat-fallow rotations and continuous wheat.**

- **Reduced chemical use was associated with some cropping patterns: less nitrogen was used on corn and wheat when preceded by hay, pasture, and other crops; less insecticide was used on corn and wheat when preceded by row crops and small grains.**



Information on cropping patterns adopted by the growers of major field crops and on associated use of nitrogen, herbicide, and insecticide comes from 1995 Cropping Practices Survey. Cropping patterns include monoculture (same crop is planted in the same field for 3 consecutive years) and crop rotations (different crops are planted every year or every other year on the same field). Potential benefits of cropping diversity on a specific field include increased nitrogen content of soil through planting of legumes; reduced incidence of plant disease and insect and weed problems; reduced loss of soil, nutrients, and moisture; increased organic matter and water-holding capacity of the soil; and reduced water pollution associated with runoff and leaching.

Land in corn. The two most dominant cropping patterns in the major corn-growing States in 1995 were corn in rotation with soybeans on 47 percent of the corn acreage, and continuous corn, on 21 percent (table 1). Nebraska was the leading State in continuous corn with more than half of its corn acreage in this pattern. The rotation of corn and soybeans, on the other hand, was prevalent in Midwestern States. Lower levels of nitrogen fertilizer and insecticide were applied on fields where corn was preceded by row crops and small grains.

Land in soybeans. Soybeans in rotation with corn was the predominant cropping pattern in the major soybean-growing States, occurring on nearly 60 percent of the soybean acreage (table 2). In contrast, continuous soybeans (monoculture) occurred on only 10 percent of the acreage. Northern States more frequently grew soybeans in rotation with corn, whereas Southern States more frequently practiced monoculture. Because soybeans are a nitrogen-fixing crop, only 12 to 30 percent of the soybean acreage received nitrogen fertilizer application.

Land in cotton and wheat. The predominant cropping patterns in the major wheat-growing States were wheat-fallow and continuous wheat (tables 3 and 4). In the moisture-limited Great Plains, farmers prefer the moisture-conserving wheat-fallow rotation. Continuous wheat, on the other hand, is the preferred pattern in Oklahoma, Texas, and Kansas. Lower application rates of nitrogen fertilizer were associated with wheat preceded by hay and pasture, and less insecticide use with wheat preceded by row crops and small grains. Geographic differences in wheat insect infestations may be a factor in the latter. In 1995, 68 percent off the cotton acreage in the 6 major cotton-growing States followed a continuous cotton pattern (table 5). Cotton in rotation with row crops accounted for 21 percent. Acreage in cotton received more insecticide application than acreage in corn, soybeans, or wheat.

Contact: Mohinder Gill; (202) 219-0447, [mgill@econ.ag.gov].

About AREI UPDATES

AREI UPDATES is a periodic series that supplements and updates information in **Agricultural Resources and Environmental Indicators (AREI)**, USDA, ERS, AH-705, Dec. 1994. **UPDATES** report recent data from surveys of farm operators and others knowledgeable about changing agricultural resource use and conditions, with only minimal interpretation or analysis. Please contact the individual listed at the end of the text for additional information about the data in this **UPDATE**. If you would like to be added to the mailing list or have other questions about **AREI UPDATES** or **AREI**, contact Richard Magleby, (202) 219-0436. [rmagleby@econ.ag.gov]

Table 1--Cropping patterns used on land in corn, 17 major growing States, 1995

Cropping patterns[1]	DE	GA	IL	IN	IA	KS	KY	MI	MN	MO	NE	NC	OH	PA	SD	TX	WI	Total 17 States
	Million acres planted																	
	0.15	0.40	10.20	5.40	11.70	2.15	1.28	2.45	6.70	1.65	8.00	0.80	3.30	1.38	2.80	2.10	3.65	65.10
	Percent of acres																	
Continuous corn	33	31	14	10	17	51	16	27	9	18	51	14	13	34	8	26	21	21
Rotation with:																		
Soybeans[2]	33	7	64	63	67	16	56	20	64	41	28	54	33	16	36	1	17	47
Other row crops[3]	30	46	13	20	13	10	18	26	12	29	12	17	23	5	8	54	11	16
Row crops & small grains	1	2	1	1	*	nr	2	nr	5	nr	1	2	nr	2	38	nr	2	3
Idle or fallow	3	14	3	5	1	22	6	24	1	8	7	11	25	11	8	17	6	7
Hay, pasture, other	nr	nr	1	1	*	nr	2	1	1	3	nr	nr	4	4	nr	nr	24	2
All other patterns[4]	0	0	4	0	1	1	0	2	8	1	1	2	2	28	2	2	12	4

nr = not reported. * = Less than 1.

[1]Based on crops planted in spring/summer 1993 through spring/summer 1995. [2]Alternating corn and soybeans. [3]All other continuous row crop rotations except alternating corn and soybeans, e.g. soybeans-corn-corn. [4]Specific rotation data not available.

Source: USDA, ERS, 1995 Cropping Practices Survey data.

Table 2--Cropping patterns used on land in soybeans, 14 major growing States, 1995

Cropping patterns[1]	AR	GA	IL	IN	IA	KY	LA	MN	MS	MO	NE	NC	OH	TN	Total 14 States
	Million acres planted														
	3.45	0.32	9.75	5.00	9.30	1.17	1.07	5.90	1.85	4.60	3.10	1.15	4.05	1.13	51.48
	Percent of acres														
Continuous soybeans	23	23	2	2	2	19	56	nr	64	16	1	12	12	28	10
Rotation with:															
Corn[2]	3	4	77	62	84	58	12	75	4	31	60	29	51	36	58
Other row crops[3]	7	16	15	25	12	9	8	8	9	28	34	14	14	5	16
Row crops and small grains	30	1	1	nr	1	nr	12	12	11	nr	2	1	1	nr	4
Idle or fallow	1	8	2	4	1	3	7	2	4	11	nr	9	21	3	5
Hay, pasture, other	1	nr	nr	1	nr	nr	2	nr	1	2	nr	nr	nr	1	*
Double-cropped[4]	35	48	3	5	nr	11	3	nr	7	12	nr	31	1	27	7
All other patterns[5]	0	0	0	1	0	0	0	3	0	0	3	4	0	0	0

nr = not reported. * = Less than 1.

[1]Based on crops planted spring/summer 1993 through spring/summer 1995. [2]Alternating corn and soybeans. [3]All other continuous row crop rotations except alternating corn and soybeans, e.g. soybeans-corn-corn. [4]Double-cropped by planting and harvesting soybeans after harvesting winter wheat. [5]Specific rotation data not available.

Source: USDA, ERS, 1995 Cropping Practices Survey data.

Table 3--Cropping patterns used on land in winter wheat, 13 major growing States, 1995[1]

Cropping patterns[2]	CO	ID	IL	KS	MO	MT	NE	OH	OK	OR	SD	TX	WA	Total 13 States
							Million acres harvested							
	2.70	0.77	1.39	11.00	1.23	1.37	2.10	1.21	5.20	0.83	1.52	2.80	2.15	34.27
							Percent of acres							
Continuous wheat or small grains	73	11	1	49	8	6	11	nr	94	6	14	62	7	44
Rotation with:														
Fallow	13	17	nr	21	nr	59	49	nr	*	59	29	3	66	21
Row crops	2	17	86	7	76	nr	11	93	1	7	14	12	5	15
Idle or fallow[3]	10	55	8	20	5	35	28	7	4	20	43	22	21	18
Hay, pasture, other	1	nr	nr	1	nr	nr	1	nr	nr	5	nr	nr	nr	1
Double-cropped[4]	nr	nr	4	2	11	nr	nr	nr	nr	nr	nr	nr	nr	1
All other patterns[5]	2	4	1	0	0	1	0	0	1	3	0	1	1	0

nr = not reported. * = Less than 1.

[1]Winter wheat planted in fall of 1994 and harvested in 1995. [2]Based on crops planted fall 1992 through fall 1994. No information on crops planted in 1995 after the wheat was harvested. [3]Includes idle or fallow in rotation but not wheat-fallow-wheat. [4]Double-cropped by planting soybeans after harvesting winter wheat in 1994. [5]Specific rotation data not available.

Source: USDA, ERS, 1995 Cropping Practices Survey data.

Table 4--Cropping patterns used on land in spring and durum wheat, 1995

Cropping patterns[1]	Spring wheat				Total 4 States	Durum wheat
	MN	MT	ND	SD		ND
			Million acres planted			
	2.25	3.95	8.30	1.25	15.75	2.95
			Percent of acres			
Continuous wheat	13	13	19	10	16	23
Rotation with:						
Fallow	2	55	7	7	18	28
Other small grains	5	2	15	2	9	12
Row crops and small grains	75	1	42	74	39	18
Idle or fallow	2	27	11	2	13	14
Hay, pasture, other	1	nr	nr	1	nr	1
All other patterns[2]	2	2	6	4	5	4

nr = not reported

[1]Based on crops planted spring/summer 1993 through spring/summer 1995. [2]Specific rotation data not available.

Source: USDA, ERS, 1995 Cropping Practices Survey data.

Table 5--Cropping patterns used on land in cotton, six major growing States, 1995

Cropping patterns[1]	AZ	AR	CA	LA	MS	TX	Total 6 States
			Million acres planted				
	0.36	1.17	1.17	1.09	1.46	6.40	11.65
			Percent of acres				
Continuous cotton	64	86	51	86	88	61	68
Rotation with:							
Sorghum	1	nr	nr	nr	nr	9	5
Other row crops	3	11	14	12	10	20	16
Row crops and small grains	4	3	7	nr	1	1	2
Idle or fallow	15	nr	22	2	1	7	7
All other patterns[2]	13	0	6	0	0	2	2

nr = not reported.

[1]Based on crops planted spring/summer 1993 through 1995. [2] Specific rotation data not available.

Source: USDA, ERS, 1995 Cropping Practices Survey data.

Table 6--Chemical use by cropping patterns on land in major field crops, 1995

Crop/cropping patterns	Nitrogen applied		Herbicide applied		Insecticide applied	
	Percent[1]	Rate[2]	Percent[1]	Rate[2]	Percent[1]	Rate[2]
Land in corn: (17 States)						
Continuous corn	97	138	96	2.5	58	0.81
Rotation with:						
Row crops	98	136	99	2.8	18	0.67
Row crops & small grains	90	85	94	2.2	4	1.00
Idle or fallow	98	120	94	2.7	25	0.76
Hay, pasture, other crops	94	69	89	2.3	22	0.90
Land in soybeans: (14 States)						
Continuous soybeans	18	22	94	1.3	8	0.56
Rotation with:						
Row crops	16	24	99	1.1	1	0.47
Row crops & small grains	24	26	91	1.4	1	0.63
Idle or fallow	12	15	95	1.3	0.4	0.57
Hay, pasture, other crops	id	52	id	0.9	id	id
Double-cropped with wheat	30	43	93	1.2	4.0	0.55
Land in cotton: (6 States)						
Continuous cotton	85	92	98	2.2	72	2.3
Rotation with:						
Row crops	93	90	95	1.8	82	2.3
Row crops & small grains	95	137	83	2.2	84	2.2
Idle or fallow	80	122	95	1.4	81	2.3
Land in all wheat: (15 States)						
Continuous wheat	87	62	63	0.3	9	0.36
Rotation with:						
Small grains	96	73	95	0.7	2	0.50
Row crops and small grains	96	79	67	0.5	1	0.30
Idle or fallow	81	55	44	0.4	1	0.38
Hay, pasture, other crops	76	52	82	0.5	id	id
Double-cropped with soybeans	87	74	46	0.1	id	id

id = insufficient data.

[1]Percent of planted acres receiving an application.

[2]Average application rate in lbs. of active ingredient per treated acre.

Source: USDA, ERS, 1995 Cropping Practices Survey data.

The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication or program information (braille, large print, audiotape, etc.) should contact the USDA Office of Communications at (202) 720-2791.

To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, DC 20250, or call 1-800-245-6340 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.

AREI UPDATES
Natural Resources and Environment Division
1301 New York Ave., NW, rm 524
Washington, DC 20005-4788

FIRST CLASS
POSTAGE & FEES PAID
USDA
PERMIT NO. G-145